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(54) Antiperspirants

(57) Compositions for controlling malodour and perspiration contain (a) 0.5 to 30 wt.% of an antiperspirant material (b) 0.5 to 25% of a residue masking agent with a refractive index above 1.40 and (c) 0.1 to 5% of a trihydroxystearin suspending agent. The active material may be aluminium chlorohydrate and the masking agent is e.g. an aliphatic hydrocarbon or ester, an aromatic ester, a 12 to 15C alkyl benzoate or especially FINSOLV TN (RTM). The trihydroxystearin is preferably used as THIXCIN (RTM). Compositions maybe in form of aerosols.

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ANTIPERSPIRANT COMPOSITIONS

TECHNICAL FIELD

The present invention relates to compositions and methods for the treatment or prevention of malodour associated with human perspiration which have a reduced tendency to leave antiperspirant/deodorant residue on the human skin.

BACKGROUND OF THE INVENTION

Antiperspirant compositions have become a part of many persons' personal care and grooming regimen. The antiperspirant active materials which have been typically used include astringent metallic (e.g., aluminium, zinc, and zirconium) salts such as salts of aluminium halides, aluminium hydroxyhalides, zirconyl oxyhalides, zirconyl hydroxyhalides, and complexes of aluminium, zirconium and amino acid (e.g., glycines). These materials can be formulated and delivered via suspensions and emulsions. Additionally, it is generally perceived as unpleasant for the antiperspirant composition to have a "wet" feel upon application to the skin. Hence, it is also desirable to deliver the antiperspirant active to the skin by a vehicle which minimises this feeling of wetness. The delivery vehicle must also not cause excessive staining of the user's clothing, and

should control or reduce chalky appearance on the skin (and potential rub-off onto the user's clothes) resulting from the antiperspirant active, suspension agent, or other material in the composition. For these reasons, a variety of volatile silicones and non-volatile silicone emollients, and combinations thereof, have commonly been utilized in liquid antiperspirant compositions for delivery of the antiperspirant active material.

The primary silicone material used in recent times for delivery of antiperspirant actives in roll-on liquid antiperspirant applications is volatile cyclomethicone. Volatile cyclomethicone provides a very dry feel upon application and has a low heat of evaporation. The low viscosity of the volatile fluids is also important for providing an easily flowable composition for roll-on or aerosol application. In many of these compositions, a relatively low level of certain low-volatility silicone fluids, or other low-volatility emollients such as paraffin oil (e.g., mineral oil) are also included. These low-volatility fluids generally have a high enough viscosity so that they remain deposited on the skin throughout a significant portion of the day. They also reduce appearance of, and consequently rub-off of, chalk-like residue formed from the antiperspirant composition's particulate ingredients and in addition they aid the adhesion of the active material. These low-volatility materials are typically utilized at relatively low levels (about 1% to about 12%) to minimise an undesirable "greasy" feel which they can impart.

Liquid roll-on antiperspirant compositions such as these are exemplified in numerous publications including US-A-4,863,721, Beck et al., issued September 5, 1989. EP-A-330,140, published August 30, 1989, and US-A-4,423,041, Clum et al., issued December 27, 1983.

Other liquid emollients have also been used in liquid anti-perspirant compositions. These include paraffins such as mineral oil, and a variety of alcohols and esters of alcohols and fatty acids. However, these emollients also have draw-backs which, typically, include skin irritation and greasy feel.

In addition to the delivery of an effective amount of antiperspirant/deodorant active material to the human skin it is further desired that the composition should leave minimal antiperspirant residue on the human and clothes. It has been found that improvements in both skin residue performance and consistent dosing can be achieved by careful selection of particular residue masking and suspending agents.

It is an object of this invention to provide compositions effective for delivering antiperspirant/deodorant performance in addition to improved dosing and reduced incidence of chalky appearance of residue on skin and clothes.

SUMMARY OF THE INVENTION

According to one aspect of the invention there is provided an antiperspirant /deodorant composition for controlling malodour and perspiration comprising:

(a) from about 0.5% to about 30% by weight of an antiperspirant active material;
(b) from about 0.5% to about 25% by weight of a residue masking agent having a refractive index of greater than about 1.40;and
(c) from about 0.1% to about 5% by weight of a trihydroxy stearin suspending agent.

The essential as well as optional components of the present invention are described below. All levels and ratios are on a weight basis as a percentage of final composition unless otherwise specified.

DETAILED DESCRIPTION OF THE INVENTION

Applicant has found that in addition to delivery of effective antiperspirant/deodorant activity compositions demonstrating improved residue masking and consistent dosing characteristics can be achieved by careful selection of both the residue masking and suspension agents.

ANTIPERSPIRANT ACTIVE MATERIAL

An essential component of the present compositions is an antiperspirant active material. Any particulate compound or composition or mixture thereof having antiperspirant activity can be used. Astringent metallic salts are preferred antiperspirant materials for use herein, particularly including inorganic and organic salts of aluminium, zirconium, and zinc, and mixtures thereof. Particularly preferred are the aluminium and zirconium salts such as aluminium halides, aluminium hydroxy halides, zirconyl oxide halides, and zirconyl hydroxy halides, and complexes of aluminium, zirconium, and/or zinc with amino acids, e.g., glycines.

Specific, exemplary aluminium salts that can be used include aluminium chloride and the aluminium hydroxyhalides having the general formula $Al_2(OH)_aQ_b.XH_2O$ where Q is chloride, bromide, or iodide (preferably chloride); a is from about 2 to about 5, and a+b = about 6, and a and b do not need to be integers; and where X is from about 1 to about 6, and X does not need to be an integer. Particularly preferred are the aluminium chlorhydroxides referred to as "5/6 basic chlorhydroxide" wherein a is 5 and "2/3 basic chlorhydroxide" wherein a is 4. Aluminium salts of this type can be prepared in the manner described more fully in US-A-3,887,692, Gilman, issued June 3, 1975; US-A-3,904,741, Jones and Rubino, issued September 9, 1975; US-A-4,359,456, Gosling et al., issued November 16, 1982; and GB-A-2,048,229, Fitzgerald et al., published December 10, 1980. Mixtures of aluminium salts are described in GB-A-1,347,950, Shin, et al., published February 27, 1974.

The zirconium compounds which may be used in the present invention include both zirconium oxy salts and zirconium hydroxy salts, also referred to as the zirconyl salts and zirconyl hydroxy salts. These are preferred compounds for use herein and may be represented by the following general empirical formula:

$$ZrO(OH)_{2-nz}B_z$$

wherein z may vary from about 0.9 and to about 2 and need not be an integer; n is the valence of B; 2-nz is greater than or equal to O; and B may be selected from the group consisting of halides (preferably chloride), nitrate, sulfonate, sulfate, and mixtures thereof. Although only zirconium compounds are exemplified in this specification, it will be understood that

other Group IVB metal compounds, including hafnium, could be used in the present invention.

As with the basic aluminium compounds discussed above, it will be understood that the above formula is intended to represent and include compounds having co-ordinated and/or bound water in various quantities, as well as polymers, mixtures and complexes of the above. As will be seen from the above formula, the zirconium hydroxy salts actually represent a range of compounds having various amounts of the hydroxy group, varying from about 2.0 to only slightly greater than 0 groups per molecule.

Several types of antiperspirant complexes utilizing the above antiperspirant salts are known in the art. For example, US-A-4,120,948, Shelton, issued October 17, 1978 and US-A-3,792,068, Luedders et al., issued February 12, 1974, disclose complexes of aluminium, zirconium, and amino acids such as glycines. These complexes and other similar complexes with glycine amino acids are commonly known as ZAG complexes. ZAG complexes are useful herein are identified by the specification of both the molar ratio of aluminium to zirconium (hereinafter "Al:Zr" ratio) and the molar ratio of total metal to chlorine (hereinafter "Metal:Cl" ratio). ZAG complexes useful herein have an Al:Zr ratio of from about 1.67 to about 12.5 and a Metal:Cl ratio of from about 0.73 to about 1.93.

Also useful are the ZAG complexes disclosed in GB-A-2,144,992, Callaghan et al., published March 20, 1985. These ZAG actives, when analyzed by high pressure gel permeation chromatography, exhibit a distribution pattern having four or more successive peaks or "bands" where the height ratio of Banks IV to III is greater than 2:1.

More preferred are ZAG actives which have a total area under the curve of bands I and II of less than about 10%, preferably less than about 5%, more preferably less than about 2% and most preferably less than 1%.
Preferred ZAG complexes can be formed by
(a) co-dissolving in water

(1) one part $Al_2(OH)_{6-m}Q_m$, wherein Q in an anion selected from the group consisting of chloride, bromide, and iodide; and m is from about 0.8 to about 2.0:

(2) x parts of $ZrO(OH)_{2-a}Q_anH_2O$, where Q is chloride, bromide, or iodide; a is from about 1 to about 2; n is from about 1 to about 8; and x is from about 0.16 to about 1.2;

(3) p parts neutral amino acid selected from the group consisting of glycine, dl-tryptophane, dl-β-phenyl-alanine, dl-valine, dl-methionine, and β-alanine, and where p is from about 0.06 to about 0.53.

(b) co-drying the resultant mixtures to a friable solid; and

(c) reducing the resultant dried inorganic-organic antiperspirant complex to a particulate form.

A preferred aluminium compound for preparation of such ZAG type complexes is aluminium chlorhydroxide of the empirical formula $Al_2(OH)_5Cl\ 2H_2O$. Preferred zirconium compounds for preparation of such ZAG-type complexes are zirconyl hydroxychloride having empirical formula $ZrO(OH)Cl\ 3H_2O$ and the zirconyl hydroxyhalides of the empirical formula $ZrO(OH)_{2-a}Cl_2\text{-}nH_2O$ wherein a is from about 1.5 to about 1.87, and n is from about 1 to about 7. The preferred amino acid for preparing such ZAG-type complexes is glycine of the formula $CH_2(HN_2)COOH$. Salts of such amino acids can also be employed in the antiperspirant complexes. See US-A-4,017,599, Rubino, issued April 12, 1977.

A wide variety of other types of antiperspirant complexes are also known in the art. For example, US-A-3,903,258, Siegal, issued September 2, 1975, discloses a zirconium aluminium complex prepared by reacting zirconyl chloride with aluminium hydroxide and aluminium chlorhydroxide. US-A-3,979,510, Rubino, issued September 7, 1976 discloses an antiperspirant complex formed from certain aluminium compounds, certain zirconium compounds, and certain complex aluminium buffers. US-A-3,981,896, issued September 21, 1976 discloses an antiperspirant complex prepared from an aluminium polyol compound, a zirconium compound and an organic buffer. US-A-3,970,748, Mecca, issued July 20, 1976, discloses an aluminium chlorhydroxy glycinate

complex of the appropriate general formula $[Al_2(OH)_4Cl][H_2N-CH_2-COOH]$.

Of all of the above types of antiperspirant actives, preferred compounds include the 5/6 basic aluminium salts of the empirical formula $Al_2(OH)_5Cl\text{-}2H_2O$; mixtures of $AlCl_3$ $6H_2O$ and $Al_2(OH)_5Cl$ $2H_2O$ with aluminium chloride to aluminium hydroxychloride weight ratios of up to about 0.5; ZAG type complexes wherein the zirconium salt is $ZrO(OH)Cl$ $3H_2O$, the aluminium salt is $Al_2(OH)_5Cl$ $2H_2O$ or the aforementioned mixtures of $AlCl_3$ $6H_2O$ and $Al_2(OH)_5Cl$ $2H_2O$ wherein the total metal to chloride molar ratio in the complex is less than about 1.25 and the Al:Zr molar ratio is about 3.3, and the amino acid is glycine; and the ZAG-type complexes wherein the zirconium salt is $ZrO(OH)_{2-a}Cl_a$ nH_2O wherein a is from about 1.5 to about 1.87 and n is from about 1 to about 7, the aluminium salt is $Al_2(OH)_5Cl$ $2H_2O$), and the amino acid is glycine.

The most preferred antiperspirant actives useful in the compositions of the present invention are antiperspirant actives with enhanced efficacy due to improved molecular distribution. Aluminium chlorhydroxide salts, zirconyl hydroxychloride salts, and mixtures thereof having improved molecular distributions are known, having been disclosed, for example, in the following documents: US-A-4,359,456, Gosling et al., issued November 16, 1982; EP-A-183,171, Armour Pharmaceutical Company, published June 4, 1986; GB-A-2,048,229, The Gillette Company published December 10, 1980; EP-A-191,628, Unilever PLC, published August 20, 1986; and GB-A-2,144,992, The Gillette Company, published March 20, 1985.

The improved molecular distribution is determined by the known analysis method called gel permeation chromatography. This analysis method is described, for example, in several of the above patent specifications as well as in EP-A-7,191, Unilever Ltd., published January 23, 1980. It is preferred for purposes of the present invention that the antiperspirant actives utilized have enhanced efficacy due to improved molecular distribution with a ratio of peak 4 to peak 3 greater than about 0.1:1 as determined by gel permeation chromatography. This ratio, as is recognized by one skilled in the art, relates to the relative area under those

two peaks as measured by the gel permeation chromatography analysis method.

Highly desirable antiperspirant salts for use herein include aluminium chlorohydrex (sold under the name Rehydrol, by Reheis Chemical Company), aluminium chlorohydrex PEG, aluminium chlorohydrex PG, aluminium sesquichlorohydrate, aluminium sesquichlorohydrex PEG, aluminium sesquichlorohydrex PG, and mixtures thereof, particularly aluminium sesquichlorohydrate.

The compositions of the present invention contain from about 0.5% to about 30%, preferably from about 1% to about 20%, more preferably from about 5% to about 15% and especially from about 6% to about 12% by weight of antiperspirant active material.

Preferred antiperspirant materials suitable for use in the compositions according to the present invention are selected from aluminium halides and aluminium hydroxy halides and mixtures thereof. The most preferred antiperspirant material for use in the present invention is aluminium chlorohydrate as marketed under the trade names aluminium hydroxy chloride by Hoechst Celanese and as Macrospherical 95 by Reheis.

RESIDUE MASKING AGENT

The purpose of the residue masking agent in the compositions according to the present invention is to reduce visual appearance of antiperspirant active on the skin and clothes. Typically emollients such as cyclomethicone are utilised to mask antiperspirant actives. However it has now been found that improved masking can be delivered by selection of specific residue masking agents with refractive indices which closely match those of the antiperspirant active materials. Furthermore it is desirable that residue maskers suitable for use in the compositions according to the present inventions should have low volatility as exemplified by boiling points greater than about 100°C.

A residue masking agent is present in the compositions according to the present invention at levels of from about 1% to about 20%, preferably

from about 5% to about 18%, more preferably from about 8% to about 15% and especially from about 10% to about 13% by weight. The residue masking agents suitable for use in the compositions according to the present invention should have refractive indices greater than about 1.40, preferably greater than about 1.45, more preferably greater than about 1.47 wherein the refractive index is measured using a refractometer.

Preferred residue masking agents suitable for use in the compositions according to the present invention are selected from aliphatic hydrocarbons (e.g. C8-C30, preferably C10-C16, more preferably C12-C15 linear or branched hydrocarbons), aliphatic esters, aromatic esters and mixtures thereof. Suitable masking agents include, isopropyl myristate, polydecene, isoparaffins and mixtures thereof. The preferred residue masking agents for use in the compositions according to the present invention are C8-C30, preferably C10-C16, more preferably C12-C15 mono-and di-alkyl esters of aromatic carboxylic acids inclusive of benzoates and pthalates, especially the benzoate esters, marketed under the trade name FINSOLV TN (RTM) by the Finetex Co. A particular advantage of aromatic ester masking agents in the compositions according to the present invention is that they display excellent dispersion characteristics for the trihydroxystearin suspending agent. The specific combination of masking agent and suspending agent enables the suspending agent to be stabilised during processing without a requirement for extended shearing.

SUSPENDING AGENT

A trihydroxystearin suspending agent is present in the compositions according to the present invention at levels of from about 0.5% to about 4%, preferably from about 1% to about 3.5% most preferably from about 1.5% to about 3% by weight. The suspending agent suitable for use herein can be generally described as an organic gelling agent which is capable of forming a thixotropic gel network in the final composition matrix.

The purpose of the suspending agent in the compositions according to the present invention is to minimise the settling of dispersed actives within the composition matrix. The principal benefits delivered by the suspending

agents are efficient suspension combined with low residue. The specific improvements in matrix suspension are illustrated by reduced clogging of the nozzle and consistent dosing characteristics in aerosol products. A further benefit of the particular suspension agents is that they are non-particulate and as such have reduced gritty skin feel negatives in comparison to more conventional suspension agents such as organo-clays and silica.

The preferred suspension agent for the compositions according to the present invention is trihydroxy stearin available from Rheox, Inc, NJ. USA. under the trade name THIXCIN (RTM).

OPTIONAL EMOLLIENTS

The present antiperspirant composition may comprise optional emollients such as volatile silicone fluids. When present, however, such optional emollients do not total more than about 15% of the composition, and preferably no more than about 10% of the composition. Such optional emollients may be included for a variety of reasons, including both cost-saving, and cosmetic purposes. Typical volatile silicone materials include, but are not limited to, D4-D5 cyclomethicones, phenethyl pentamethyl di-siloxane, and mixtures thereof. Volatile dimethicone fluid is also contemplated herein.

The compositions of the present composition may also comprise a number of non-emollient optional components to provide cosmetic or aesthetic benefits. For example, preservatives, deodorant actives, such as anti-microbials or bactericides, perfumes, colouring agents, fillers, dyes and thickeners may be used. Suitable thickening agents include polyethylene powder manufactured by U.S.I. Chemicals (New York, New York, USA), having a mean particle diameter of less than about 20 microns.

These optional components should be chosen so as not to unduly interfere with the antiperspirant efficacy and the composition stability. Such optional components are generally present in the compositions of the present invention at a level of from about 0.01% to about 20%.

The present compositions are preferably in the form of an aerosol spray. However, the present invention may be applicable to other liquid antiperspirant product types, such as a low-viscosity roll-on liquid. Products formulated as aerosols will also comprise a propellant material. Any of the commonly used propellants in the antiperspirant art are suitable. The propellant can be any liquefiable gas conventionally used for aerosol containers. Examples of materials that are suitable for use as propellants are trichlorofluoromethane, dichlorofluoromethane, trichlorofluoromethane, dimethylether e.g. Dymel 152A (RTM) supplied by Du Pont, propane, butane and isobutane, used singly or admixed and propane butane e.g. CAP 40 (RTM). Dymel 152A and propane butane are preferred.

Compressed gases such as carbon dioxide, nitrogen and air may also be used in aerosol compositions according to the present invention.

The amount of the propellant gas is governed by normal factors as are well known in the aerosol art. The composition described previously herein serves as the concentrate and generally comprises from about 5% to about 80%, preferably 7% to about 45%, more preferably from about 20% to about 40%, of the total aerosol composition while the propellant generally comprises from about 20% to about 95%, preferably from about 30% to about 80%, more preferably from about 40% to about 60%.

If a propellant such as dimethylether utilizes a vapour pressure suppressant (e.g., trichloroethane or dichloromethane) the amount of suppressant is included as part of the propellant.

Although the non-volatile silicone or other silicone fluid, or fluid emollient may suitably serve as a carrier liquid in the compositions hereof, additional materials may also be used, particularly in the case of aerosol compositions. The carrier liquid can aid efficacy by keeping the antiperspirant compound in contact with the skin so that it does not rub off or wash off. Examples of additional materials are alcohols such as lauryl alcohol, hexadecyl alcohol, and oleyl alcohol; carboxylic acids such as

lauric and oleic acid; and lanolin and its derivatives such as acetylated lanolin.

Still other operable carrier liquids are even more hydrophilic than these esters. Among them are polyethylene glycol monolaurate and butoxy-polyoxyethylene oxypropylene glycols (the Ucon 50 HB series; trade mark -- Union Carbide).

These additional carrier liquids, if used, will typically be present in amounts from about 1% to about 15% of the total aerosol composition.

The present compositions may also contain low levels of high molecular weight polymers similar to those described in US-A-4,152,416, May 1, 1979 to Spitzer et al., especially in the case of aerosol compositions. These polymeric materials are used at a level of from about 0.005% to 5% of the total aerosol composition. Preferred materials are high molecular weight silicone gums.

The antiperspirant compositions of the present invention may be manufactured using methods known in the art. In making the compositions, the antiperspirant composition ingredients are typically well-mixed and milled. Aerosol propellant, if applicable, can be included according to standard industry practices.

The remaining components are then added to the composition using conventional formulation methods.

The present invention also provides methods for treating or preventing perspiration and malodour associated with human underarm perspiration. These methods comprise applying a safe and effective amount of the liquid antiperspirant compositions of the present invention to the skin in the auxiliary area of the human. The term a "safe and effective amount" as used herein, is an amount which is effective in eliminating or substantially reducing the production of perspiration which ultimately generates the malodours detected through formation of pungent fatty acids, while being safe for human use at a reasonable risk/benefit ratio.

The liquid antiperspirant compositions of the present invention provide excellent cosmetic attributes both on application and throughout use. They are non-sticky, non-greasy, and provide a dry feel upon application to the skin. The compositions have low incidence of staining of clothes and leaving residue on skin. In addition, the present compositions do not leave substantial levels of white, chalky residue on skin upon dry down, have relatively low incidence of rub-off, and facilitate maintenance of the antiperspirant active material on the skin throughout the in-use period. Furthermore the specific ability of the compositions according to the present invention to re-suspend the antiperspirant active facilitates consistent delivery of the active material to the skin.

The following examples illustrate the present invention.

Examples 1-2

The following compositions are liquid antiperspirant compositions that are useful for roll-on application and are representative of the present invention.

	Example Number (Wt. %)		
Component	1	2	3
Aluminium chlorohydrate	25.0	25.0	-
ZAG	-	-	25.0
Finsolv TN	72.0	71.5	72.0
Thixcin R	1.5	1.5	1.5
Dimethicone (5 cs)	-	0.5	-
Perfume	1.5	1.5	1.5

The compositions are prepared as follows. The dimethicone (if present) and Finsolv are mixed and heated to from about 43°C to about 47°C and the Thixcin is then stirred in over about 5 minutes. After 5 minutes further mixing the batch is homogenised using a J&K T50 Homogeniser fitted with a 25mm medium fine head while keeping the temperature below 50°C. After stirring and cooling to 40°C the aluminium chlorohydrate is added portionwise over 10 minutes. The mix is then stirred and allowed to cool to 30°C and the perfume is then added. Such compositions can be added to conventional roll-on bottles known in the art. The liquid

composition can then be applied to the underarm skin of a human to effectively inhibit perspiration and underarm malodour resulting from perspiration.

The antiperspirant composition provides excellent antiperspirant efficacy with good product aesthetics, residue masking and in-use characteristics.

Examples 4 to 7 illustrate liquid aerosol anitperspirant compositions which are representative of the compositions according to the present invention

	Example Number (Wt%)			
Component	4	5	6	7
Propellant CAP 30	60.0	60.0	60.0	60.0
Cyclomethicone (DC245)	14.8	20.8	12.9	18.9
Finsolv TN	12.0	12.0	12.0	12.0
Aluminiumchlorohydrate	12.0	6.0	12.0	6.0
Thixcin R	0.8	0.8	0.8	0.8
Dimethiconol/dimethicone	-	-	1.92	1.92
Perfume	0.44	0.44	0.44	0.44

The liquid aerosol antiperspirant compositions according to the present invention are prepared as follows. The cyclomethicone and Finsolv are mixed and heated to from about 43°C to about 47°C and the Thixcin is then stirred in over about 5 minutes. After 5 minutes further mixing the batch is homogenised using a J&K T50 Homogeniser fitted with a 25mm medium fine head while keeping the temperature below 50°C. After stirring and cooling to 40°C the aluminium chlorohydrate is added portionwise over 10 minutes. The mix is then stirred and allowed to cool to 30°C and the perfume is then added. This forms a base formula which can then be gassed with an appropriate propellant in a suitable can and valve system.

The aerosol antiperspirant compositions according to the present invention are valuable for providing excellent antiperspirant efficacy with good residue masking and other product aesthetics and consistent dosing characterisics.

CLAIMS

1. An antiperspirant composition for controlling malodour and perspiration comprising :
   (a) from about 0.5% to about 30% by weight of an antiperspirant active material;
   (b) from about 0.5% to about 25% by weight of a residue masking agent having a refractive index of greater than about 1.40; and
   (c) from about 0.1% to about 5% by weight of a trihydroxystearin suspending agent.

2. A composition according to Claim 1 wherein the antiperspirant active material is selected from aluminium halides and aluminium hydroxy halides and mixtures thereof.

3. A composition according to both of Claims 1 and 2 wherein the antiperspirant active material is aluminium chlorohydrate.

4. A composition according to any of Claims 1 to 3 wherein the antiperspirant active material is present at a level of from about 8% to about 17 %, preferably from about 10% to about 15% by weight.

5. A composition according to any of Claims 1 to 4 wherein the residue masking agent is present at a level of from about 1% to about 20%, preferably of from about 5% to about 18%, more preferably from about 8% to about 15%, most preferably from about 10% to about 13% by weight.

6. A composition according to any of Claims 1 to 5 wherein the residue masking agent has a refractive index of greater than about 1.45, preferably greater than about 1.47.

7. A composition according to any of Claims 1 to 6 wherein the residue masking agent is selected from aliphatic hydrocarbons, aliphatic esters, aromatic esters and mixtures thereof.

8. A composition according to any of Claims 1 to 7 wherein the residue masking agent comprises a C8-C30, preferably a C10-C16, more preferably a C12-C15 hydrocarbon.

9. A composition according to any of Claims 1 to 8 wherein the residue masking agent comprises a C8-C30, preferably a C10-C16, more preferably a C12 -C15 alkyl benzoate.

10. A composition according to any of Claims 1 to 9 wherein the suspending agent is present at levels of from about 0.5% to about 4%, preferably from about 1% to about 3.5%, more preferably from about 1.5% to about 2.5% by weight.

11. An aerosol antiperspirant composition according to any of Claims 1 to 10 comprising:
    (a) from about 0.5% to about 30% by weight of an antiperspirant active material;
    (b) from about 0.5% to about 25% by weight of a residue masking agent having a refractive index of greater than about 1.40;
    (c) from about 0.1% to about 5% by weight of a trihydroxystearin suspending agent; and
    (d) from about 20% to about 95% by weight of propellant.

Patents Act 1977

Examiner's report to the Comptroller under Section 17 (The Search report)

GB 9415453.1

Relevant Technical Fields

(i) UK Cl (Ed.N) A5B (BFG)

(ii) Int Cl (Ed.6) A61K 7/32, 7/34, 7/36, 7/38

Search Examiner
M T WENDT

Date of completion of Search
26 AUGUST 1995

Databases (see below)
(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI, CLAIMS, CAS ONLINE, JAPIO

Documents considered relevant following a search in respect of Claims :-
1-11

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	WO 94/05253 A2	(BEIERSDORF) eg see Abstract and examples 5, 10 and 14	1, 6-9
X	WO 91/04009 A1	(GILLETTE) eg see page 2 lines 4-1 , page 4 lines 1-24. Claim 1. Examples 1, 3-5.	1-3, 6-9

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